

42. On some Mammals from Jugoslavia.

By IVOR G. S. MONTAGU, F.Z.S.

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(Measurements throughout are in millimetres.)

Among the areas least fully inspected in the preparation of G. S. Miller's Catalogue * (1) were those parts of the Balkans now grouped together as Jugoslavia. In consequence of the generosity of Mr. Uvaroff, of Lord Swaythling and Mr. Cotton, material from these regions has recently been added to the British Museum collection. The former made possible the purchase of a part of the collection formed by V. Martino in Croatia, Montenegro, and Serbia; the latter made possible a small scale expedition to Slovenia and Croatia, undertaken by I. Montagu and W. E. C. Cotton.

In addition to the specimens described here and by V. and E. Martino in (2), and to specimens not of immediate interest, these collections include abundant series of *Apodemus*. No account is given here of these series, since they are all referable to the races *A. s. sylvaticus*, *A. s. dichrurus*, *A. agrarius*, and *A. epimelas*, and do not materially affect existing knowledge of the range of those forms.

The described material gives a number of noteworthy results. It indicates the presence in the Croat highlands of *T. caeca*, of a peculiar dormouse resembling that of southern Italy, and of a remarkable new species of *Evotomys*. An *E. glareolus* of the Croat lowlands, resembling that of the western Alps, is recognized as peculiar, as is also a race of *M. agrestis* from the Slovene Alps. The presence of the northern and western *M. a. arvalis* in the Croat lowlands, and that of the southern and eastern *M. a. levis* in the Slovene and Croat highlands, together with the occurrence of a new form resembling the former in eastern Serbia, throws important light on the distribution of these two subspecies. These circumstances may indicate an overlapping of the ranges of the two forms, but, in the writer's opinion, more probably

* (1) Catalogue of the Mammals of Western Europe. B.M. (N.H.), 1912.

(2) Annals and Magazine of Natural History, 9th ser. ix. p. 413, 1922.

reveal the presence of a pocket of *M. a. arvalis* extending along the Slavonian plains.

TALPA CÆCA CÆCA Savi.

Type locality. Italy.

Material examined and Dimensions. Two adults (1 ♂, 1 ♀) collected by Montagu in June 1923 in Kupjak, Croatia.

	HB.	T.	HF.
53. Adult ♂, 25. 6. 23.	112	24	17
60. „ ♀, 28. 6. 23.	122	27.5	17

Description. Both the skulls are typical in all respects except size. The skull dimensions throughout, and the length of the hind feet, while less than those of *T. europæus*, are larger than is usual in *T. cæca*; they afford, indeed, new maxima for the latter form. The mesostyles of *m*2 and *m*3 exhibit in each case the characteristic deeply-notched apex.

The presence of this species in the Croat highlands tends to confirm the view that its range is continuous across the Balkans, extending from northern Italy and Switzerland into Asia Minor.

GLIS GLIS POSTUS, subsp. n.

Type locality. Veliki Dergonel, the Gorski Kotar, Croatia.

Material examined and Dimensions. Three adults (2 ♂, 1 ♀) collected by Montagu and Cotton in July 1923 on Veliki Dergonel.

	HB.	T.	HF.	E.
65. Adult ♂, 2. 7. 23.	181	76 ¹	31	19.5
314. „ ♂, 2. 7. 23.	181	171	31.5	21
Type 66. „ ♀, 2. 7. 23.	178	150	32	20

¹ Damaged.

Description. The dorsal skin colour is yellow-grey, slightly darkened by the longer blackish hairs; the tail is essentially concolour with the dorsal fur. The animal in dorsal colour thus differs noticeably from *G. g. glis*, showing no trace of the pinkish-brown tint of that race, and approximates to *G. g. italicus*. The tail of the latter, however, is characteristically darkened by heavy pinkish-brown wash, and is accordingly readily distinguished from that of *G. g. postus*.

The dimensions of hind foot and ear are less than the average dimensions of *G. g. italicus*, but larger than those of *G. g. glis*.

The skulls are in no case complete, but examination of the available fragments indicates robust cheek-teeth and a general large size of the constituent bones, recalling the characteristic properties of *G. g. italicus*.

In view of the parallelism between the dormouse of the Croat highlands and that of southern Italy, it is well to recall that dormice from north Italy and Trieste, localities intermediate in point of space, resemble neither in any way and are exactly typical *G. g. glis*.

EVOTOMYS GLAREOLUS SOBRUS, subsp. n.

Type locality. Rescetar, Nova Gradisca, Croatia.

Material examined and Dimensions. Two adults (♀) collected by Martino in September 1921 in Rescetar.

	HB.	T.	HF.	E.
21.12.1.15. Adult ♀, 13.9.21.	93	43	18	13
<i>Type</i> 21.12.1.16. ,, ♀, 13.9.21.	101	46	18	13

Description. The dimensions indicate that this lowland bank-mouse is a small one. The dorsal colour is yet more drab than that of the typically dull skin of *E. g. helveticus*. From this and other forms the present one is readily to be distinguished by the shortness and peculiar coloration of its tail. In both the specimens this appendage is dorsally of a pale dust colour and ventrally a nearly clear white. In all described neighbouring races, *E. g. helveticus* of the western Alps, *E. g. nageri* of the eastern Alps, and *E. gorka* of the nearby highlands, the tail is dorsally a dark, nearly seal, brown and ventrally a distinctly yellow-buff.

The skull of this animal is in no way distinguishable from a typical *E. glareolus* skull of small size, such as that of *E. g. helveticus*. In both specimens the third inner angle of *m*3 is present.

EVOTOMYS GORKA, sp. n.

Type locality. Zalesina, the Gorski Kotar, Croatia.

Material examined and Dimensions. One adult (♀) collected by Montagu in June 1923 in Zalesina.

	HB.	T.	HF.	E.
<i>Type</i> 61. Adult ♀, 23.6.23.	117	54	19	12.5

Description. This specimen is a peculiar one, differing in its characters of skin and skull no less markedly from *E. glareolus sobrus* of the nearby plains than from previously described and more distant races of *Evotomys*.

The body size and skull length are equal to those of the largest European forms of *Evotomys* (*E. rufocanus*, *E. caesarius*, *E. glareolus nageri*, and *E. g. hallucalis*). The tail is relatively short.

The fur is dorsally long and shaggy and of a bright rufous colour. The flanks are without the usual grey shade, and in fact are so bright an orange-brown that the dorsal stripe pattern typical of the genus is obscured. The grey colour of the belly is a trifle darker than that characteristic of neighbouring *E. glareolus* forms.

The skull of this specimen, a fully-developed adult, shows a long palate and bullae of great size. The nasals* are longer and

* The nasal measurements given by Miller for *E. g. nageri* are doubtless over-estimates. His dimension 8.0 mm. seems to the writer barely to equal 7.8 mm.

narrower than those of *H. g. nageri*, the diastema is long, and the incisive foramina are of great length. The length of the skull from the condyle to the anterior end of the bulla is 9.25 mm. In the largest specimens of *E. glareolus* this dimension attains only 8.65 mm., and in *H. caesarius* only 8.6 mm. The enamel pattern of the teeth exactly resembles that of a typical *E. glareolus*, in which the third re-entrant angle on the inner side of *m3* is present.

MICROTUS AGRESTIS PUNCTUS, subsp. n.

Type locality. Bled, Slovenia.

Material examined and Dimensions. One young adult (♀) collected by Cotton in June 1923 in Bled.

	HB.	T.	HF.	E.
<i>Type</i> 304. Young adult ♀, 10.6.23.	87	37	19	12

Description. The dorsal colour is almost black, relieved on the shoulders and face by a slight tawny peppering. In this respect the animal nearly resembles young specimens of *M. a. levernedii*. In *M. a. levernedii*, however, the flanks shade gradually into the ventral greyish-yellow wash; in the present specimen the flanks are tawny, and readily contrast with the ventral white. The white of the belly, though interrupted here and there by the appearance of the slaty bases of the hairs, shows no trace of yellow. The tail is bicoloured and the feet dark.

Measurements of the reconstructed skull indicate the presence of a long brain-case like that of *M. a. levernedii*. The skull presents a unique character in that the anterior edge of the masticatory plate is inclined forward. The distance from the incisors to the lower anterior corner of the plate is accordingly less than in similarly sized skulls of other forms. The pattern of the teeth is that of typical *M. agrestis*, in which the fourth inner angle of *m1* is not present.

MICROTUS ARVALIS ARVALIS Pallas.

Type locality. Germany.

Material examined and Dimensions. Seven adults (♀) collected by Martino in August and September 1921 in Nova Gradisća, Croatia.

	HB.	T.	HF.	E.
21.12.1.8. Adult ♀, 17.8.21.	100	37	15.5	11
21.12.1.9. " ♀, 17.8.21.	100	35	15	11
21.12.1.10. " ♀, 17.8.21.	104	34.5	15.4	11
21.12.1.11. " ♀, 17.8.21.	100	37	15.8	10.3
21.12.1.12. " ♀, 12.9.21.	97	35	15	11
21.12.1.13. " ♀, 15.9.21.	110	36	10.5	12
21.12.1.14. " ♀, 16.9.21.	104	36	15.5	11.4
Average of seven adults	102.1	35.8	15.5	11.1

Description. The dorsal fur is a lighter shade of yellow than that usually seen in more northerly specimens. The belly colour is white, often with the slaty bases of the ventral hairs readily perceptible; in three specimens there are traces of yellowish wash.

The skulls show the characteristic short brain-case and arc-like zygomas of *M. a. arvalis*.

MICROTUS ARVALIS LEVIS Miller.

Type locality. Rumania.

Material examined and Dimensions. Two young adults (1 ♂, 1 ♀) collected by Montagu and Cotton in June 1923 in Bled, Slovenia. One young adult (♂) collected by Montagu in June 1923 in Kupjak, Croatia.

BIED.	HB.	T.	HF.	E.
47. Young adult ♂, 16. 6. 23.	102	29	16	11
305. " " ♀, 16. 6. 23.	88	28	14	11
KUPJAK.				
55. Young adult ♂, 26. 6. 23.	99	30	18	12

Description. The dorsal brown coloration of the skins is noticeably bright. In each example, and particularly in No. 47, this brightness is present also on the flanks in such a manner as to form a line of demarcation more definite than is usual in *M. arvalis*. The belly is silvery without yellow wash. The feet are nearly seal-brown.

The skulls of these specimens are those of typical *M. a. levis*, showing the characteristic long brain-case and straight parallel zygomas.

MICROTUS ARVALIS CALYPSUS, subsp. n.

Type locality. Nova Varoš, Serbia.

Material examined and Dimensions. One adult (♂?) collected by Martino in June 1921 in Nova Varos.

	HB.	T.	HF.	E.
Type 219. Adult ♂?, 13. 6. 21.	101	38	15	11

Description. The dorsal colour is pale yellow, distinctly lighter than that of *M. a. arvalis*, slightly overlaid with grey in a median line. The ventral surface is clear silver. The feet are whitish yellow and the tail bicolour, dorsally seal-brown, ventrally whitish yellow.

The size of the skull and hind feet resembles in its smallness *M. a. arvalis* rather than *M. a. levis*.

The skull shows the remarkable combination of a long brain-case and arc-like zygomas. In other respects it is not peculiar.

Skull dimensions.

<i>T. o. caeca.</i>	1.	2.	3.	4.	5.	6.	7.	8.		
53. Adult ♂, 31.7	11.1	15.75	9.45	4.25	20.6	12.0	12.3			
60. „ ♀, 31.8	10.85	15.8	9.5	4.25	20.8	12.25	12.5			
<i>E. gorka.</i>	1.	2.	9.	10.	11.	12.	13.	6.	7a.	8a.
Type 61. Adult ♀, 20.65	13.85	4.3	12.2	6.8	7.9	8.2	15.6	6.0	5.7	
<i>E. g. sobrus.</i>										
21.12.1.15. Adult ♀, 24.4	13.8	4.1	11.7	6.45	7.15	7.0	15.0	5.6	5.3	
Type 21.12.1.16. „ ♀, 23.4	13.1	4.0	11.15	6.3	6.7	6.55	14.0	5.75	5.5	

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| 1. Condylobasal length. | 8. Mandibular tooth-row (ex. incisors). |
| 2. Zygomatic breadth. | 8a. Mandibular check-teeth. |
| 3. Breadth of brain-case. | 9. Interorbital constriction. |
| 4. Depth of brain-case. | 10. Occipital breadth. |
| 5. Rostral breadth. | 11. Occipital depth. |
| 6. Mandible. | 12. Nasal. |
| 7. Maxillary tooth-row (ex. incisors). | 13. Diastema. |
| 7a. Maxillary check-teeth. | |